Math 212
Requiz 19A

F 21 Oct 2016 / N 23 Oct 2016

Your name: _____

Exercise

(5 pt) Find the global minimum and maximum values of the function $f : \mathbf{R}^2 \to \mathbf{R}$ given by

$$f(x, y) = x^2 + y^2 - 2x + 2y - 1$$

on the closed disc $D \subseteq \mathbf{R}^2$ of radius 2 centered at the origin.

(a) (.5 pt) Justify why a global minimum and maximum exist in this case. *Hint:* Name a theorem, and validate its hypotheses.

(b) (2 pt) Find all critical points in the interior of D. *Hint:* You should find exactly one.

(c) (2 pt) Find all critical points on the boundary of D. *Hint:* You should find exactly two. Parametrize the boundary of D using polar coordinates.

(d) (.5 pt) State the global minimum and maximum values of f on D.